PCT/AU98/00854
Received 02 September 1999

CLAIMS

1. A method of dispersing an active water-insoluble agrochemical principal in an aqueous solution comprising the following steps:

(i) providing a formulation comprising at least one active water-insoluble agrochemical principal and at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds; and

(ii) dispersing said formulation in an aqueous medium;

with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene.

2. A method according to claim 1 wherein the alternating copolymer has an alternating character defined by greater than 70% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

3. A method according to claim 1 wherein the alternating copolymer has an alternating character defined by greater than 90% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

4. A method according to claim 1 wherein the alternating copolymer contains additional comonomer residues which will not substantially change the alternating character of the copolymer.

5. A method according to claim 1 wherein the first comonomer is selected from the group consisting of fumaric acid, maleic acid and anhydrides, and the esters, amides and imides derived from them, itaconic acid and anhydride and the corresponding esters amides and imides derived from them, acrylic and methacrylic acids and the corresponding esters and amides derived from them, vinylphosphonic acid and the corresponding esters and amides derived from it and ethylene sulphonic acid and the esters and amides derived from it.

6. A method according to claim 1 wherein the second comonomer is selected from the group consisting of styrene and its alkyl and halo derivatives, vinyl ethers and esters, α-olefins, internal olefins, exocyclic and endocyclic olefins, allylic alcohols and their corresponding ester derivatives, allylic ethers and allylic halo compounds, allylic aryl compounds, vinyl amides, vinyl chloride and vinylidene chloride.

7. An agricultural formulation comprising at least one insoluble material and at least

one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene.

8. An agricultural formulation according to claim 7 wherein the formulation is in the form of a suspension concentrate (SC), a wettable powder (WP) or a water dispersible granule (WG).

9. An agricultural formulation according to claim 7 wherein the alternating copolymer has an alternating character defined by greater than 70% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

10. An agricultural formulation according to claim 7 wherein the alternating copolymer has an alternating character defined by greater than 90% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

11. An agricultural formulation according to claim 7 wherein the alternating copolymer contains additional comonomer residues which will not substantially change the alternating character of the copolymer.

12. An agricultural formulation according to claim 7 wherein the first comonomer is selected from the group consisting of fumaric acid, maleic acid and anhydrides, and the esters, amides and imides derived from them, itaconic acid and anhydride and the corresponding esters amides and imides derived from them, acrylic and methacrylic acids and the esters and amides derived from them, vinylphosphonic acid and the corresponding esters and amides derived from it and ethylene sulphonic acid and the esters and amides derived from it.

13. An agricultural formulation according to claim 7 wherein the second comonomer is selected from the group consisting of styrene and its alkyl and halo derivatives, vinyl ethers and esters, α-olefins, internal olefins, exocyclic and endocyclic olefins, allylic alcohols and their corresponding ester derivatives, allylic ethers and allylic halo compounds, allylic aryl compounds, vinyl amides, vinyl chloride and vinylidene chloride.

14. An agricultural formulation according to claim 7 wherein the dispersant is an agriculturally acceptable salt of the alternating copolymer and wherein the salt comprises sodium, potassium and/or ammonium ions.

15. An agricultural formulation according to claim 7 wherein the alternating copolymer is in the form of its free acid.

16. An agricultural formulation according to claim 7 wherein the dispersant is a water-soluble agriculturally acceptable derivative of the alternating copolymer wherein said derivative is selected from the group consisting of polyalkyleneoxy derivatives, polyethyleneglycol derivatives, polyamide derivatives and polyvinyl alcohol derivatives.

17. An agricultural formulation according to claim 7 wherein alternating copolymers are in the range of from 1000 to 90000 daltons.

18. An agricultural formulation according to claim 7 wherein the water-insoluble materials are selected from the group consisting of herbicides, insecticides, fungicides, biocides, molluscicides, algaicides, plant growth regulators, anthelmintics, rodenticides, nematocides, acaricides, amoebicides, protozoacides, fertilizers, crop safeners, fillers and carriers and other adjuvants.

19. An agricultural formulation according to claim 7 wherein the formulation further comprises a surfactant wetting agent.

20. An agricultural formulation according to claim 19 wherein the surfactant wetting agent is selected from the group consisting of an alkylpolysaccharide; di or mono alkyl sulphosuccinate derivative; a nonionic surfactant loaded onto an inert silicate carrier; and a non-ionic surfactant delivered in the form of a urea surfactant complex.

21. A method of making an agrochemical formulation comprising the step of:

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(i) combining at least one insoluble material, and at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene.

22. A method according to claim 21 comprising the steps of:

(i) combining at least one insoluble material, and at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene;

(ii) milling said combination to a particle size range in order to obtain a stable, readily-suspendible aqueous dispersion; and

(iii) stabilising said aqueous dispersion to obtain an SC formulation suitable for dilution in water for agricultural use.

23. A method according to claim 21 comprising the steps of:

(i) combining at least one insoluble material, with at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene; and

(ii) milling said combination to a desired particle size to obtain a homogeneous wettable powder (WP) formulation.

24. A method according to claim 21 comprising the steps of:

(i) combining at least one insoluble material suitable for agricultural use with at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at

least one residue of a second comonomer, wherein said first comonomer comprises α,β- unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene; and

(ii) blending said combination to obtain a homogeneous wettable powder (WP) formulation.

25. A method according to claim 21 comprising the steps of:

(i) combining at least one insoluble material suitable for agricultural use with at least one dispersant comprising a water soluble agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene;

(ii) agglomerating said combination to form discrete granular materials; and

(iii) drying said granular materials to obtain a water dispersible granule WG formulation.

26. A method according to claim 21 wherein the alternating copolymer has an alternating character defined by greater than 70% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

27. A method according to claim 21 wherein the alternating copolymer has an alternating character defined by greater than 90% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer,

28. A method according to claim 21 wherein alternating copolymer contains additional comonomer residues which will not substantially change the alternating character of the copolymer.

29. A method according to claim 21 wherein the first comonomer is selected from the group consisting of fumaric acid, maleic acid and anhydrides, and the esters, amides and imides derived from them, itaconic acid and anhydride and the corresponding esters amides and imides derived from them, acrylic and methacrylic acids and the corresponding esters and amides derived from them, vinylphosphonic acid and the corresponding esters and amides derived from it and ethylene sulphonic acid and the esters and amides derived from it.

30. A method according to claim 21 wherein the second comonomer is selected from the group consisting of styrene and its alkyl and halo derivatives, vinyl ethers and esters, α-olefins, internal olefins, exocyclic and endocyclic olefins, allylic alcohols and their corresponding ester derivatives, allylic ethers and allylic halo compounds, allylic aryl compounds, vinyl amides, vinyl chloride and vinylidene chloride.

31. A method according to claim 21 wherein the dispersant is an agriculturally acceptable salt of the alternating copolymer and wherein the salt comprises sodium, potassium and/or ammonium ions.

32. A method according to claim 21 wherein the alternating copolymer is in the form of its free acid.

33. A method according to claim 21 wherein the dispersant is a water- soluble agriculturally acceptable derivative of the alternating copolymer wherein said derivative is selected from the group consisting of polyalkyleneoxy derivatives, polyethyleneglycol derivatives, polyamide derivatives and polyvinyl alcohol derivatives.

34. A method according to claim 21 wherein alternating copolymers are in the range of from 1000 to 90000 daltons.

35. A method according to claim 21 wherein the water-insoluble materials are selected from the group consisting of herbicides, insecticides, fungicides, biocides, molluscicides,

algaicides, plant growth regulators, anthelmintics, rodenticides, nematocides, acaricides, amoebicides, protozoacides, fertilizers, crop safeners, fillers and carriers and other adjuvants.

36. A method according to claim 21 wherein the formulation further comprises a surfactant wetting agent.

37. A method according to claim 36 wherein the surfactant wetting agent is selected from the group consisting of an alkylpolysaccharide; di or mono alkyl sulphosuccinate derivative; a nonionic surfactant loaded onto an inert silicate carrier; and a non-ionic surfactant delivered in the form of a urea surfactant complex.

38. A method according to any one of claims 23 to 25 wherein said dispersant achieves a percentage suspensibility of greater than 80%.

39. A method according to claim 22 wherein said dispersant achieves a percentage suspensibility of greater than 90%.

40. A method according to either claim 23 or claim 24 wherein the milling step produces an average particle size in the range of from 5 to 15μm.

41. A method according to claim 25 wherein the milling step produces an average particle size in the range of from 5 to 15μm.

42. A method according to claim 25 wherein the formulation has a dispersion time of less than 1 minute.

43. A method according to claim 25 wherein the formulation has a dispersion time of less than 20 seconds.

44. A method according to claim 25 wherein the formulation has a wet sieve retention for a 150 μm sieve of less than 0.1% retained material and for a 53 μm sieve of less than 0.6%.

45. A method according to claim 22 wherein the milling step produces a mean particle size of less than 5µm.

46. A method according to claim 22 wherein the milling step produces a mean particle size in the range of from 1 to 3 µm.

47. An agricultural formulation produced by the method of any one of claims 22 to 25.

48. A method of treatment of a substrate with an active water-insoluble agrochemical principal comprising the following steps:

(i) preparing a formulation comprising at least one active water-insoluble agrochemical principal and at least one dispersant comprising a water soluble

agriculturally acceptable derivative of an alternating copolymer or an agriculturally acceptable salt thereof wherein said alternating copolymer comprises at least one residue of a first comonomer and at least one residue of a second comonomer, wherein said first comonomer comprises α,β-unsaturated oxyacids or anhydrides and said second comonomer comprises olefinic compounds containing one or more polymerizable double bonds, with the proviso that the alternating copolymer is not a copolymer of maleic anhydride and diisobutylene;

(ii) dispersing said formulation in an aqueous medium; and

(iii) applying the dispersed formulation to a substrate.

49. A method according to claim 48 wherein the alternating copolymer has an alternating character defined by greater than 70% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer.

50. A method according to claim 48 wherein the alternating copolymer has an alternating character defined by greater than 90% of consecutive comonomer residue units being alternate between residues of the first comonomer and the second comonomer,

51. A method according to claim 48 wherein alternating copolymer contains additional comonomer residues which will not substantially change the alternating character of the copolymer.